Testing a quantitative model for dark energy

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The idea that dark energy is gravitational waves (e.g., see the review by Frieman et al. 2008) may explain its strength and its time-evolution: The concept is that dark energy is the ensemble of coherent bursts (solitons) of gravitational waves originally produced when the first generation of super-massive back holes were formed (Caramete & Biermann 2010): the energy density of such solitons suffices within the uncertainties. These solitons get their initial energy as well as keep up their energy density throughout the evolution of the universe by stimulating emission from a background (Biermann & Harms 2013): Our model of the background metric resembles the Randall-Sundrum ideas (1999a, b) but is time-dependent, and describes the energy flow from the background (strong-gravity) brane to our brane. Planck data strongly suggest that dark energy has increased in strength over cosmic time (Planck 2013 XVI), fully consistent with the concept here. Gravitational waves were far below today's dark energy at the epoch of Big Bang Nucleosynthesis and of the formation of the Microwave Background ripples (as summarized in Ligo+Virgo-Coll. 2009), also consistent with the concept since the first massive stars and the first supermassive black holes may have formed at redshifts of order 30 - 80 (Biermann & Kusenko 2006). The transit of these gravitational wave solitons may be detectable: Key tests include pulsar timing (e.g. Kramer 2010), clock jitter (e.g. Predehl et al. 2012), the radio- (Fixsen et al., Kogut et al., Seiffert et al. 2011; Condon et al. 2012), X-ray, gamma- and neutrino-background, and the early formation of pure-disk galaxies (Kormendy et al. 2010, 2011; Kormendy & Bender 2011).